

110-WS-25SP-20

User Manual

20 Watt Solar Panel & Charge Controller

110-WS-25SP-20



20W Solar Panel & Charge Controller
with
Pole Mount Bracket

Phone (530) 823-7185

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Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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CONTENTS

1	FORWARD	4
2	INTRODUCTION	4
3	SPECIFICATIONS	4
4	INSTALLATION	5
5	CONNECTION	5
6	OPERATION	6
7	MAINTENANCE	7
8	TROUBLESHOOTING	7

1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **110-WS-25SP-20 Solar Panel** is simple to install and use. The rugged aluminum frame is attached to a variable-angle bracket that mounts to a mast or tower. A fully-encapsulated regulator is pre-wired to the panel, providing up to 1120 mA current ideal for charging 12 V batteries. The 3 meter (9.8') cable includes a 2-pin quick-connect plug designed for easy connection to NovaLynx logger systems.

The **110-WS-25SP-20** Solar Panel is optimal for charging 12V sealed lead-acid battery systems. Do NOT use it to charge 6V, 24V or 36V batteries. With a properly-sized battery and adequate sunshine, the panel can supply continuous loads up to 120 mA.

3 SPECIFICATIONS

110-WS-25SP-20 Solar Panel (BC-20W-PM panel and regulator)	
Rated Power Output	20 Watt
Power Tolerance	+/- 5%
Operating Power Voltage	18V
Operating Power Current	1.12A
Open Circuit Voltage (Voc)	21.6V
Short Circuit Current (Isc)	1.17A
Trickle Charging Current	0.2A
Floating Charging Voltage	13.8V
Overcharge Protection Voltage	14.4V
Current Temperature Coefficient	0.05% / °C
Voltage Temperature Coefficient	-0.37% / °C
Power Temperature Coefficient	-0.45% / °C
Operating Temperature	-40°C to 85°C
Max. Snow / Wind Load	2400 Pa
Wire Gauge / Cable Length	20AWG / 3m (9.8')
Environmental Protection	IP65
Solar Panel Measurements	420 x 335 x 18mm (16.5 x 13.2 x 0.7 inch)

4 INSTALLATION

Select a location that provides maximum exposure to sunlight. In the northern hemisphere, the front surface of the panel should face south. In the southern hemisphere, the panel should face north.

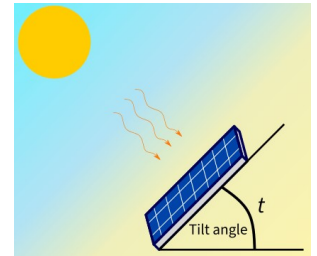
Shade on even a small portion of the panel surface greatly lowers the efficiency of the panel, so avoid placing the panel near or under trees, buildings, or any other objects that cast a shadow.

Avoid placing the panel below structures where birds will perch. If birds use the panel itself as a landing spot, it may be necessary to apply a spike strip along the top edge of the mounting bracket to keep the panel from being covered with bird droppings.

Regular maintenance includes cleaning the top surface of the panel whenever dust or debris collects. Place the panel at a height where it is not difficult to reach for regular cleaning.

The 110-WS-25SP-20 Solar Panel mounting bracket is adjustable so that the optimum angle for a particular latitude can be achieved. The best angle varies throughout the year, however a good compromise can be reached by determining your coordinates and entering them into an on-line calculator. One such calculator can be found at:

<https://solarsena.com/solar-panel-tilt-angle-calculator/>

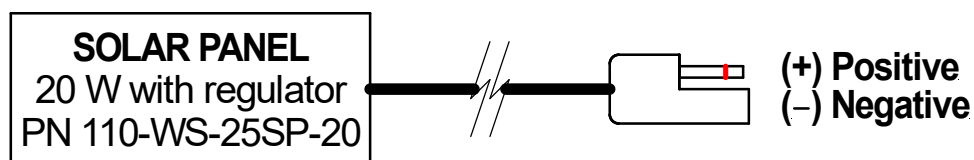


Assemble the panel and mounting bracket onto a vertical mast or tower (sold separately), and make sure the face of the panel points south (northern hemisphere). Adjust the tilt angle, then tighten all bolts (an "L" wrench is provided to secure the bolts).

Route the cable to the logger or battery box, and secure the cable to the mast at 2' intervals to prevent the cable from whipping in the wind.

5 CONNECTION

The 110-WS-25SP-20 Solar Panel cable is provided with a 2-pin quick-connect plug which makes connection to NovaLynx loggers a simple matter. The plug not only provides insulation which helps prevent sparks, but also ensures that the polarity is correct for connection to the logger system. If the quick-connect plug has been removed (i.e. the cable has flying leads), special precautions must be taken to ensure that the exposed wires do not short together, and that proper polarity is observed.



CAUTION – Connect battery power to the logger **BEFORE** connecting the solar panel to the system. Otherwise the logger may not "boot" properly, or excessive voltage may be applied to the logger system. Do the reverse when powering down, i.e. disconnect the solar panel, and then unplug the battery to turn off the logger.

CAUTION – The solar panel produces electricity whenever it is exposed to sunlight. There is always the danger of short-circuiting which could cause sparks or damage to other electrical equipment if not connected properly. It is advisable to cover the solar panel with an opaque cloth while connecting the cable.

It is best to "boot" the logger from the battery before connecting the solar panel to the system. In the case of NovaLynx loggers, this means connect the red battery connector to the positive battery terminal first. The logger will start up normally and the battery will be in the circuit when the charger connection is made. Cover the panel with an opaque cloth. Connect the solar panel by plugging the quick-connect plug on the solar panel cable into the quick-connect plug inside the logger enclosure. After the solar panel is connected, remove the opaque cloth from the panel. **Note:** *in some systems the battery is in a separate enclosure from the logger. In this case route the cable from the solar panel to the battery box.*

6 OPERATION

The operation of the regulator is completely automatic. The controller will regulate the charging of the battery during conditions of heavy usage, and when left unattended for long periods of time.

Intelligent Charge & Maintain

The built-in intelligent MPPT charge controller chips generate at least 10%-20% more power than traditional controllers. The smart 3-stage charging algorithm is improved to better charge and maintain a 12v battery, keeping the battery topped off in all seasons.

Protection

Protects the battery from over-charge, over-voltage, discharge, short circuit, and reversed polarity. The electronics are waterproof and spark-proof.

Adjustable Pole Mount Bracket

The pole mount bracket allows you to easily adjust the solar panel angle from 0-15-30-45-60 degrees. The mounting bracket is designed for a pole diameter of 1.5 to 3.0 inches (40-80mm). A removable V-block insert has been added to accommodate even smaller poles.



Visual Monitor

The colorful LED indicator helps to visually monitor the working status during charging. Charging will be cut off automatically when the battery is fully charged, and resumed as needed and sunlight allows.

LED Status	Indication
Off	No output
Blink Green	Sunshine is effective (Not active yet)
Blink Red	Working to charge battery (Activated)
Solid Green	Battery is fully charged
Solid Red	Error-Short circuit/Reversed polarity

7 MAINTENANCE

Under normal conditions very little maintenance is required, but in areas where dust accumulates, the panel may need to be cleaned frequently.

1. Wash the surface of the solar panel as required using clean water and a soft cloth. Add a mild liquid detergent to the water to remove heavy soil, if needed, then use clean water to rinse. Do not use abrasive cleaners which might scratch the glass, reducing efficiency.
2. Tighten the bolts on the mounting bracket to ensure the panel is held securely.
3. Make sure the cable is secured to prevent whipping in the wind.
4. Trim any nearby trees that cast a shadow on the solar panel.
5. Install bird spikes if necessary.

8 TROUBLESHOOTING

Power supply issues usually show up when the battery voltage gets too low for the system to function. It can be difficult to identify the cause, as there are many parts to the system. Efficient troubleshooting involves understanding the possible causes and eliminating simplest cases first.

1. Check the Visual Monitor LED to determine whether there is a detected fault (Solid RED indication).
2. If there is a fuse in the system, check the fuse with an ohm-meter. If the fuse is burned out, determine where the fault lies and correct it before trying a new fuse.
3. Many system failures are due to poor electrical connections.
 - a. Visually inspect all connections.
 - b. Tighten screw terminal connections.
 - c. Where wires are held by crimp connectors, tug gently on the wires to check whether the connection is tight. Re-crimp as required. **NOTE:** *crimp connections may also be soldered for maximum durability.*
- d. Disconnect and re-connect plug-style connectors, to refresh the connection.